



**UNITED STATES DEPARTMENT OF COMMERCE**  
**Pat nt and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|
|-----------------|-------------|----------------------|---------------------|

09/311,480 05/13/99 LEE

W D-17965

UNION CARBIDE CORPORATION  
LAW DEPARTMENT E205  
39 OLD RIDGEBURY ROAD  
DANBURY CT 06817-0001

IM62/1124

EXAMINER

KRUER, K

ART UNIT

PAPER NUMBER

1773

DATE MAILED:

11/24/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

# Office Action Summary

Application No.  
09/311,480

Applicant(s)  
Lee et al.

Examiner  
Kevin Kruer

Group Art Unit  
1773



- ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

- ☒ Claim(s) 1-10 is/are pending in the application.
- Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-10 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

- ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- ☒ Notice of References Cited, PTO-892
- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 1
- ☐ Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 1773

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 1, 7, and 9, the phrase "based on the weight of the copolymer or a silicon rubber" is indefinite. It is unclear whether (a) the amount of acrylonitrile is based upon the copolymer or silicon rubber or (b) the composition may optionally contain a nitrile rubber or a silicone rubber. In claims 3 and 7, the phrase "and methacrylic acid esters wherein the ester is present in the copolymer in an amount of about 20 to about 55 percent by weight" is indefinite. It is unclear whether (a) if a methacrylate is used, then the ester is present in the copolymer in an amount of about 20 to about 55 percent by weight, or (b) the ester is present in the copolymer in an amount of about 20 to about 55 percent by weight regardless of which copolymer is utilized. The preamble of claim 7 is unclear. Applicant claims "one or more" or "two or more." This seems repetitive since "one or more" is inclusive of "two or more." Furthermore, Applicant claims communication media or electrical conductors "a core" in some embodiments but not in others. However, since every embodiment must be "surrounded" by the claimed layer, would this mean all embodiments have a core? In claim 10, applicant claims carbon nanotubes "per 100 parts by weight of polymer." There is insufficient antecedent basis for "of polymer" in the claim.

Art Unit: 1773

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admissions in view of Nahass et al. (Pat. No. 5,591,382). Applicant admits that a typical electrical power cable generally comprises one or more conductors in a cable core that is surrounded by several layers of polymeric materials. Those layers include a first semiconducting shield layer, an insulating layer, a second semiconducting shield layer, a metallic tape or wire shield and a protective jacket. Typical strippable shield compositions contain a polyolefin, such as ethylene/vinyl acetate (EVA) with a high vinyl acetate content, conductive carbon black, and organic peroxide crosslinking agents. Carbon black is usually included in amounts of about 20 to about 60 percent by weight based upon the weight of the composition. Nitrile rubber may be added for the purpose of reducing the composition's strip force (see pages 1 and 2 of the specification).

Applicant does not admit that carbon fibrils (aka nanotubes) are commonly added to semiconducting shield compositions. However, Nahass teaches that carbon fibrils have been used in place of carbon black in conductive compositions. Compared to carbon black, less carbon fibril is necessary to reach the desired conductivity. Furthermore, a polymer's tensile and flexural characteristics are enhanced when carbon fibrils are added (col 1, line 54- col 2, line 5).

Art Unit: 1773

Therefore, the examiner takes the position that it would have been obvious to utilize carbon fibrils in place of carbon black because less carbon fibril is needed to reach the desired conductivity and the carbon fibrils increase the polymer's tensile and flexural characteristics.

5. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ongchin (Pat. No. 4,286,023) in view of Nahass et al. (Pat. No. 5,591,382). Ongchin teaches an article of manufacture comprising one or more strands of a conducting metal or alloy, a layer of semiconductive shielding, a layer of insulation and a layer of strippable semi-conductive composition. The strippable semiconductive material comprises (A) an ethylene copolymer selected from the group consisting of an ethylene-alkyl acrylate copolymer containing from about 15-45wt% acrylate or ethylene vinyl acetate containing 15-60wt% acetate, (B) a nitrile rubber containing 10-50wt% acrylonitrile, (C) conductive carbon black, and (D) a peroxide crosslinking agent (col 2, lines 4-19). The ratio of (A) to (B) is between 9:1 and 1:9. The conductive carbon black is added in amounts of 10 to 150 parts per 100 parts of (A)+(B) (col 2, lines 19-26).

Ongchin does not teach that carbon fibrils (aka nanotubes) may be added to the semiconducting shield compositions. However, Nahass teaches that carbon fibrils have been used in place of carbon black in conductive compositions. Compared to carbon black, less carbon fibril is necessary to reach the desired conductivity. Furthermore, a polymer's tensile and flexural characteristics are enhanced when carbon fibrils are added (col 1, line 54- col 2, line 5).

Therefore, the examiner takes the position that it would have been obvious to utilize carbon fibrils in place of carbon black because less carbon fibril is needed to reach the desired conductivity and the carbon fibrils increase the polymer's tensile and flexural characteristics.

Art Unit: 1773

6. Claims 5, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ongchin (Pat. No. 4,286,023) in view of Nahass et al. (Pat. No. 5,591,382), as applied to claims 1-4 above. Ongchin in view of Nahass is relied upon as above. However, neither reference teaches that carbon black and carbon fibrils may be utilized together in a semiconducting shield composition. However, the courts have held that it is prima facie obvious to combine two or more compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose. The idea of combining them flows logically from their having been individually taught in the prior art. *In re Kerkhoven* 626, F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). Therefore, the examiner takes the position that it would have been obvious to one of ordinary skill in the art to utilize both carbon black and carbon fibrils in the same semiconducting shielding composition because Nahass teaches both fillers are used analogously/interchangably in conductive compositions.

Furthermore, the courts have held that "When the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller* 220, F.2d, 44, 456, 105 USPQ 233, 235 (CCPA 1955). In the present situation, it would have been obvious to utilize carbon black and carbon fibrils as conductive fillers in the same composition. The examiner takes the position that it would have been obvious to optimize the amounts of carbon black and carbon fibrils in order to obtain the desired conductivity. Furthermore, it would have been obvious to one of ordinary skill in the art to vary the amount of carbon fibril with relation to the amount of carbon black in order to control the composition's tensile and flexural characteristics.

Art Unit: 1773

7. Claims 1, 6, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ongchin (Pat. No. 4,286,023) in view of Silver et al. (Pat. No. 4,317,001) and Nahass et al. (Pat. No. 5,591,382). Ongchin teaches an article of manufacture comprising one or more strands of a conducting metal or alloy, a layer of semiconductive shielding, a layer of polyethylene insulation and a layer of strippable semi-conductive composition. The strippable semiconductive material comprises (A) an ethylene copolymer selected from the group consisting of an ethylene-alkyl acrylate copolymer containing from about 15-45wt% acrylate or ethylene vinyl acetate containing 15-60wt% acetate, (B) a nitrile rubber containing 10-50wt% acrylonitrile, (C) conductive carbon black, and (D) a peroxide crosslinking agent (col 2, lines 4-19). The ratio of (A) to (B) is between 9:1 and 1:9. The conductive carbon black is added in amounts of 10 to 150 parts per 100 parts of (A)+(B) (col 2, lines 19-26).

Ongchin does not teach that the insulation layer should comprise conductive filler. However, Silver teaches an insulation layer for an electric cable wherein the insulative layer should have a volume resistivity of at least the order of  $10^{10}$  ohm\*cm. In order to obtain such a resistivity, conductive particles (e.g., carbon black) may be added to the insulating composition in amounts of less than 2.5wt% (col 1, lines 18-41). Therefore, the examiner takes the position that it would have been obvious to add low amounts of a conductive particle to the polyethylene insulative layer taught by Ongchin in order to obtain the desired volume resistivity.

Neither Ongchin nor Silver teaches that carbon fibrils (aka nanotubes) should be utilized as the conductive filler added to the insulating layer. However, Silver teaches the addition of carbon black conductive fillers to insulative layers and Nahass teaches that carbon fibrils have

Art Unit: 1773

been used in place of carbon black as conductive filler. The courts have held that in order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art. *In re Ruff*, 256 F.2d 590, 118 USPQ 340 (CCPA 1958). Since Nahass teaches that both carbon black and carbon fibrils have been utilized equivalently as conductive filler, and Silver teaches the addition of conductive fillers to insulative layers, the examiner takes the position that it would have been obvious to one of ordinary skill in the art to utilize carbon fibril as the conductive filler in the insulation layer. Furthermore, it has been recognized that the addition of carbon fibrils to polymers can be used to enhance the tensile and flexural characteristics of the polymer to which they are added (col 1, line 54- col 2, line 5). Therefore, the examiner takes the position that it would have been obvious to utilize carbon fibrils in place of carbon black because the carbon fibrils increase the tensile and flexural characteristics of the insulation layer.

8. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0420271A1 (aka Burns et al.) in view of Nahass et al. (Pat. No. 5,591,382). Burns teaches an insulated electrical conductor comprising one or more strands of a conducting metal or alloy, a layer of semiconductive shielding, a layer of insulation and a layer of strippable semi-conductive composition (page 2, lines 6-12). The strippable semiconductive material comprises (A) 40-65wt% an ethylene-vinyl acetate copolymer containing 27-45wt% acetate, (B) 5-30wt% nitrile rubber containing 25-55wt% acrylonitrile, (C) 25-45wt% conductive carbon black, and (D) a peroxide crosslinking agent (page 3, lines 15-22).



Art Unit: 1773

Burns does not teach that carbon fibrils (aka nanotubes) may be added to the semiconducting shield compositions. However, Nahass teaches that carbon fibrils have been used in place of carbon black in conductive compositions. Compared to carbon black, less carbon fibril is necessary to reach the desired conductivity. Furthermore, a polymer's tensile and flexural characteristics are enhanced when carbon fibrils are added (col 1, line 54- col 2, line 5). Therefore, the examiner takes the position that it would have been obvious to utilize carbon fibrils in place of carbon black because less carbon fibril is needed to reach the desired conductivity and the carbon fibrils increase the polymer's tensile and flexural characteristics.

9. Claims 5, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0420271A1 (aka Burns et al.) in view of Nahass et al. (Pat. No. 5,591,382), as applied to claims 1-4 above. Burns in view of Nahass is relied upon as above. However, neither reference teaches that carbon black and carbon fibrils may be utilized together in a semiconducting shield composition. However, the courts have held that it is prima facie obvious to combine two or more compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose. The idea of combining them flows logically from their having been individually taught in the prior art. *In re Kerkhoven* 626, F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). Therefore, the examiner takes the position that it would have been obvious to one of ordinary skill in the art to utilize both carbon black and carbon fibrils in the same semiconducting shielding composition because Nahass teaches both fillers are used analogously/interchangeably in conductive compositions.

Art Unit: 1773

Furthermore, the courts have held that "When the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller* 220, F.2d, 44, 456, 105 USPQ 233, 235 (CCPA 1955). In the present situation, it would have been obvious to utilize carbon black and carbon fibrils in the same composition. Therefore, the examiner takes the position that it would have been obvious to optimize the amounts of carbon black and carbon fibrils in order to obtain the desired conductivity. Furthermore, it would have been obvious to one of ordinary skill in the art to vary the amount of carbon fibril with relation to the amount of carbon black in order to control the composition's tensile and flexural characteristics.

#### *Conclusion*

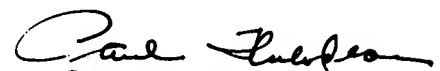
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin R. Kruer whose telephone number is (703) 305-0025. The examiner can normally be reached on Monday-Friday from 7:00 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau, can be reached on (703) 308-2367. The fax phone number for the organization where this application or proceeding is assigned is (703)305-5436.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0651.



Kevin R. Kruer  
Patent Examiner



Paul Thibodeau  
Supervisory Patent Examiner  
Technology Center 1700